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IMPROVING QUALITY OF ENVIRONMENT THROUGH ENVIRONMENT-BEHAVIOR STUDIES: An Annotated Bibliography

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FORWARD

In recent years there has been a rapid increase in the number of articles related to environmental and behavior studies. The purpose of this annotated bibliography is to present a selected set of those articles in an organized framework to facilitate initial reading efforts in this area of study. A number of good related bibliographies are available, particularly those accompanying the overview articles in Section 1.2, but none are both annotated and organized. It is for this reason that this bibliography has been prepared.

Some of the library research was conducted by the following students at Middle East Technical University: architects Feride Çiçekoğlu and Galib Khan; planners Ayda Serdaroğlu and Muhammad Shoaib; sociologist Mehmet Harmanci; and planning assistants Argun Evyapan and Tamer Gök. The search procedures used are outlined in the Appendix.

There are both annotated and unannotated sections in this bibliography. The annotated section contains very specific references from books and periodicals, and is organized into six main parts with references listed alphabetically by author within each part. This is followed by an unannotated section which contains only books, special issues of periodicals, and conference proceedings listed alphabetically by author or editor. Only the most important parts of these references are included in the annotated portion of the bibliography. They are listed again in this separate section since they represent the easiest source of additional references.

The organization of the annotated portion evolved from a course entitled Environment and Behavior given by the author at Middle East Technical University during the Spring semester 1973. This organization proceeds from the general to the specific. It starts with introductory references, then basic theoretical positions and related methodologies, and the relationship to current environmental design theory. Then three specific aspects of environment-behavior interaction are considered: first, the affect of the physical environment on human interaction; second, the role of perception and cognition in the environment; and third, the question of diversity and adaptability.

The scope of literature in environment-behavior studies is broad and diverse. Articles cut across any divisional system, but this organization is nevertheless offered as a structure of some usefulness to initial reading efforts in the area.

TABLE OF CONTENTS

1. GENERAL INTRODUCTION TO ENVIRONMENT AND BEHAVIOR STUDIES

This general introductory part of the bibliography is divided into three sections. The first contains some of the endless number of articles which call for improvement in environmental design capabilities and achievements, particularly those pointing toward environment and behavior studies. This section also presents articles outlining the opportunities for interdisciplinary studies incorporating environmental design and the social sciences.

The second section lists the few comprehensive reviews of current research which exist. This is a suggested starting point for students just beginning to study this area. The third section is directed toward the persistent argument about environmental determinism and states both advocate and opponent positions. These articles have been separated from other references to behaviorism or propinquity because they focus directly on, and argue for or against, the concept of determinism.

These overviews of current studies, an initial exposure to the question of determinism, and the opportunities for interdisciplinary studies should provide a basis for understanding subsequent sections.

1.1. GENERAL CONCERN AND INTERDISCIPLINARY POSSIBILITIES

Some of the references in this section express a general concern for learning how to design physical environments for people. Others present the insights to be gained from various social science disciplines, particularly sociology, ecology, anthropology and psychology, and suggests the advantages of interdisciplinary collaboration.

Buttimer, Anne. "Sociology and Planning," Town Planning Review, Vol. 42, April 1971, pp. 145-180.

A description of the potential areas of communication between sociology and planning with a historical perspective, and an emphasis on social surveys, social pathology, social disorganization research and community studies.

Canter, David. "Architectural Psychology, An Introduction," Architectural Psychology, edited by Canter. London: RIBA Publications, 1970, pp. 4-6.

Architectural psychology is described as that area of psychology which considers people from the viewpoint of their interaction with the environment. The theoretical orientations of current studies are reviewed.

Gans, Herbert. "Planning for People, Not Buildings," Environment and Planning, Vol. 1, No. 1, 1969, pp. 33-46.

A comprehensive statement of the problem dealing with the antecedents of planning in the U.S., the minimal effect of physical planning, a section on how to plan for people, the differences between the values of planners and the public, and a discussion of the problem of planning in a heterogeneous community.

Mead, Margaret. "Research with Human Beings: A Model Derived from Anthropological Field Practice," Ekistics, Vol. 28, No. 164, July 1969, pp. 9-13.

An explanation of anthropological field practice with an emphasis on the subjects as participants, thus avoiding the charge of experimenting with humans.

Michelson, William. "A Frame of Reference," Man and His Urban Environment, Reading, Massachusetts: Addison-Wesley Publishing Company, 1970, pp. 3-57.

A review of the field of human ecology, a proposal for an intersystem congruence model where environment is considered as an independent variable along with culture, social, personality and organismic systems; and an examination of various concepts of the environment--Lynch and Rodwin, Doxiades, Webber, Parr and Chein.

Peattie, Lisa. "The Social Anthropologist in Planning," Journal of the American Institute of Planners, Vol. 33, July 1967, pp. 266-268.

A discussion of participant observation, and the interaction between anthropologists and planners, with a conclusion that this way of working does not merely provide data for conventional planning but tends to develop views of social reality somewhat different from those commonly held by planners.

Proshansky, Harold M. "Methodology in Environmental Psychology: Problems and Issues," Human Factors, Vol. 14, No. 5, October 1972, pp. 451-460.

A definition of environmental psychology as an inter-disciplinary, problem oriented field concerned with the interrelations among physical settings and human behavior and experience, and a warning about the severe limitations of the laboratory experiment.

Willmott, Peter. "Social Research and New Communities," Journal of the American Institute of Planners, Vol. 33, November 1967, pp. 387-398.

A review of studies in British new town communities which take into consideration social aspects of behavior such as age structure and the adaptation process.

1.2. OVERVIEWS OF MAN-ENVIRONMENT STUDIES

This section contains the few articles which have reviewed the scope of current research in environment and behavior, some offering systems of organization to guide addition study.

Canter, David. "Architecture and Psychology," Built Environment, Vol. 1, No. 3, 1972, pp. 188-190.

An examination of the new discipline of architectural psychology in terms of the methods of study, and a description of some findings in the use of space, meaning in architecture, traditional problems like noise, heating, and appraisals of existing environments. The necessity for a conceptual framework which allows a two way interaction between and environment is proposed.

Craik, Kenneth. "Environmental Psychology," New Directions in Psychology 4, New York: Holt, Rinehart and Winston, 1970, pp. 3-121.

This review article has sections on human behavior in the built environment and the geographic environment; comprehension of the molar physical environment dealing with research techniques and methodologies; and the urbanite at home and on tour, a more detailed presentation of mapping developments and role expectations as research possibilities.

Mann, Lawrence, and George Hagevik. "The New Environmentalism: Behaviorism and Design," Journal of the American Institute of Planners, Vol. 37, No. 5, September 1971, pp. 344-347.

An examination of the literature in psychology and sociology related to environment with special attention given to Environmental Psychology edited by Proshansky, Ittelson and Rivlin; Michelson's Man and His Urban Environment; and McHarg's Design with Nature.

Rapoport, Amos. "Some Observations Regarding Man-Environment Studies," Architecture and Research Training, Vol. 2, No. 1, November 1971, pp. 4-15.

This comprehensive coverage of recent research is organized into three sections: 1) perception and cognition with a focus on cultural variability, vision and complexity, and images, values and schemata; 2) design and behavior with a focus on crowding, environmental quality, propinquity and interaction, and privacy; and 3) designers as form givers.

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Tuan, Y. F. "Environmental Psychology: A Review," Geographical Review, Vol. 62, April 1972, pp. 245-256.

Environmental psychology is reviewed under the threefold schema of learning theory, environmentalism, and design. Particular attention is given to a review of Environmental Psychology edited by Proshansky, Ittelson and Rivlin; and to the concepts of change in the environment, congruence between human activities and the environment, and the environment intervening in man's favor.

1.3. ENVIRONMENTAL DETERMINISM

The articles in this section all focus specifically on the debate about environmental determinism, with both advocate and opponent positions represented. There are related references in Section 2.2 Behaviorism, and Section 4.4 Propinquity Case Studies.

Broady, Maurice. "Social Theory in Architectural Design," Planning for People, London: Bedford Square Press, 1968, pp. 11-24.

Three kinds of inaffective architectural theorizing are considered, one being the concept of architectural determinism. Several examples of determinism are discussed with the conclusion that architectural design is complementary to human activity but does not shape it.

Gans, Herbert. "Environment and Behavior," People and Plans, New York: Basic Books Inc., 1968, pp. 1-33.

Several chapters in this section on environment and behavior offer arguments against the concept of physical determinism: the consideration of the difference between potential and effective environment, the effect of a community on its residents, and a review of Jane Jacob's The Death and Life of Great American Cities.

Lee, Terence L. "Psychology and Architectural Determinism, Part 1," Architect's Journal Information Library, August 4, 1971, pp. 253-262.

Architectural determinism is considered within the framework of three influences: genetic endowment, past experience, and the immediate physical and social environment, with the conclusion that the concept of human interaction with the environment is a valid and necessary starting point.

Lee, Terence L. "Psychology and Architectural Determinism, Part 2," Architect's Journal Information Library, September 1, 1971, pp. 475-483.

Three practical studies which support environmental determinism are presented; the concept of neighborhood, the distribution and provision of leisure facilities, and people's shopping behavior.

Lee, Terence L. "Psychology and Architectural Determinism, Part 3," Architect's Journal Information Library, September 22, 1971, pp. 651-659.

In this last article of the series, further research techniques are presented related to environmental determinism, followed by a discussion of design criteria in behavioral terms.

Lee, Terence L. "The Effect of Built Environment on Human Behavior," Ekistics, Vol. 34, No. 200, July 1972, pp. 20-24.

A review of the literature related to environmental determinism and an examination of the possible integration with Lee's concept of socio-spatial schema.

Rosow, Irving. "The Social Effects of the Physical Environment," Journal of the American Institute of Planners, May 1961, pp. 127-133.

The assumption that planned manipulation of the physical environment can change social patterns in determinate ways is stated to be only selectively true, applying mainly to extreme housing situations. Consideration is given to social pathology, livability, community integration and aesthetics.

Rusch, Charles W. "On the Relation of Form to Behavior," Emerging Methods in Environmental Design and Planning, Cambridge, Massachusetts: MIT Press, 1970, pp. 278-282.

A satirical statement about the lack of correlation between environmental variables and a person's well being, and a proposal for satisfying behavior rather than controlling it.

2. THEORETICAL APPROACHES AND RELATED METHODOLOGIES

The theory of interaction between environment and behavior is in a state of flux. It appears to be moving from a deterministic perspective towards one which emphasizes a continuing and mutual interaction between environment and behavior, and the individuality of man's view of the environment. This part of the bibliography is divided into sections which correspond to the major current theoretical positions.

The first presents the advocates of a behavioristic viewpoint, where environmental variables are considered as inputs and behavior as an output. This is the basis for a deterministic approach. The second section presents Barker's concept of an environment composed of behavior settings and the related observational techniques. The third section contains phenomenological studies, principally those related to Kelly's personal construct theory and Osgood's semantic differential development. These focus on the individual and his expectations of the environment.

Taken collectively, these articles represent the theoretical bases underlying most of the current environment-behavior research. It is particularly interesting since they represent quite different positions with equally different approaches to understanding the problem. An integration of these concepts and methodologies has not yet developed.

2.1. GENERAL STATEMENTS AND BASIC ASSUMPTIONS

This section contains articles which set forth basic assumptions about the interaction between man and environment, or identify theoretical concepts unrelated to behaviorism, ecological balance or phenomenology.

Canter, David. "Should We Treat Building Users as Subjects or Objects?," Architectural Psychology, edited by Canter. London: RIBA Publications, 1970, pp. 11-18.

Users may be treated either as objects, whose behavior is of interest, or as subjects, whose experience is of interest. Canter believes that understanding the interaction between these two outlooks is important if psychology is to be useful in man-environment studies.

Frederickson, Norman. "Toward a Taxonomy of Situations," American Psychologist, February 1972, pp. 114-123.

An examination of various possibilities for taxonomies which describe the environment and a proposal for considering one which classifies situations based on elicited behavior. This would involve a three dimensional matrix including subjects, behaviors and situations which could then be studied across any pair of dimensions. Several examples are given as illustrations.

Hillier, W.R.G. "Psychology and the Subjet Matter of Architectural Research," Architectural Psychology, edited by Canter. London: RIBA Publications, 1970, pp. 25-29.

A warning against carrying cut empirical work in architectural psychology without making the basic premises clear. This is followed by a definition of experiental as consisting of a physical system, and experimental system and their interaction. Finally, strategies for research are presented.

Proshansky, Harold, William Ittelson and Leanne Rivlin. "The Influence of the Physical Environment on Behavior: Some Basic Assumptions," Environmental Psychology, New York: Holt, Rinehart and Winston, 1970, pp. 27-37.

A statement of thirteen basic assumptions about the complex relationship between environment and behavior based on behavior mapping studies. These assumptions include such concerns as the constancy of behavior in a setting, alternatives to physical environment change, the inseparability of man and environment, the uniqueness of the environment at any given stage.

Sells, S. B. "An Interactionist Looks at the Environment," American Psychologist, Vol. 18, 1963, pp. 696-702.

A statement of three principles which are universally accepted in psychology: the principle of determinism, multiple determination of behavior, and the principle of interaction.

Sonnenfeld, Joseph. "Social Interaction and Environmental Relationship," Environment and Behavior, Vol. 4, No. 3, September 1972, pp. 267-277.

A discussion of the monadic and dydadic models of human behavior and the limitations of each in dealing with man-environment relationships, and a proposal for a man-environment-other man model.

Wohlwill, Joachim F. "The Emerging Discipline of Environmental Psychology," American Psychologist, Vol. 25, 1970, pp. 303-312.

A presentation of three forms of interrelationship between behavior and environment: 1) behavior as it occurs in some particular environmental context; 2) the influences of environmental variables on general attributes of behavior and personality; and 3) behavior as it is instigated by and directed at particular attributes of the physical environment such as stimulus properties and adaptation.

2.2. BEHAVIORISM

The articles in this section consider the man-environment interaction from a behavioristic viewpoint, establishing clear relationships between environmental manipulation and behavioral system responses. Related articles are found in Section 1.3 Environmental Determinism.

Lee, Terence L. "Do We Need a Theory?," Architectural Psychology, edited by Canter. London: RIBA Publications, 1970, pp. 19-25.

The eventual theory of man-environment interaction may be one which emphasizes the mutual interaction, but prior to that, we must use a more deterministic approach in which inputs are aspects of the built environment and the outputs are human behavior and feelings.

Studer, Raymond. "The Dynamics of Behavior-Contingent Physical Systems," Environmental Psychology, edited Proshansky, Ittelson and Rivlin, New York: Holt, Rinehart and Winston, 1970, pp. 56-76.

Human needs are rejected as a viable unit of analysis in favor of units of behavior. Given a requisite system of behaviors, the problem is then stated as one of defining, specifying, realizing and verifying a phsyical system. The dynamics of environment-behavior systems and the role of disequilibrium are also discussed.

Studer, Raymond. "Some Aspects of the Man-Designed Environment Interface," Response to Environment, edited by Coates and Moffet. Raleigh, North Carolina: Student Publication of the School of Design, North Carolina State University, 1969, pp. 77-98.

Designed environments are viewed as experimental settings which are monitored and manipulated to maintain equilibrium in the interface. Dissonance in this environment-behavior interface is discussed, as is the environment as a learning system, with stimulus, response and reinforcement events.

Studer, Raymond and David Stea. "Architectural Programming, Environmental Design and Human Behavior," Journal of Social Issues, Vol. 22, No. 4, October 1966, pp. 127-136.

An examination of the difficulties of environmental design, and a proposal to focus on the behavior systems as an independent variable. The interactions and conflicts between these behavior systems can then be examined and appropriate physical environments designed.

2.3. ECOLOGICAL PSYCHOLOGY

The articles in this section are all related to Roger Barker's behavior setting approach to the study of human activities in natural physical settings.

Barker, Roger G. and Louise S. Barker. "Behavior Units for the Comparative Study of Cultures," Studying Personality Cross Culturally, edited by Kaplan, New York: Harper and Row, 1961, pp. 457-476.

A statement of the methods and conclusions of a cross cultural study of children's behavior using behavior setting research. The focus is on the use of the behavior setting as the unit for cross cultural study.

Barker, Roger G. "Explorations in Ecological Psychology," American Psychologist, Vol. 20, 1965, pp. 1-14.

Transducer research is presented as allowing comparison of behavior episodes, social inputs and environmental force inputs. One conclusion is that the structure of the environment is not isomorphic with structure of behavior, that behavior and environment are mutually causally related systems, and that behavior is a combination of the setting and the individual.

Barker, Roger G. Ecological Psychology, Stanford: Stanford University Press, 1968, pp. 1-52.

First, a general discussion of ecological units; then a detailed description of the behavior setting, its characteristics, its tests and variable properties and sources of behavior milieu synomorphy; and the methodological details of the behavior setting survey and the index of interdependence.

Bechtel, Robert B. "A Behavioral Comparison of Urban and Small Town Environments," EDRA Two, edited by Archea and Eastman. Pittsburgh: Carnegie-Mellon University, 1970.

A comparison was made between the residential areas of a small town and two residential city blocks using Barker's behavior setting survey technique. The purpose was to determine if the technique was applicable to urban environments and what modifications were necessary.

Gump, Paul V. "The Behavior Setting: A Promising Unit for Environmental Designers," Landscape Architecture, Vol. 61, No. 2, January 1971, pp. 130-134.

A general summary of the behavior setting concept, non-behavioral factors, standing behavior patterns and relationships between behavioral and non-behavioral factors.

Ittelson, William, Leanne Rivlin, and Harold Proshansky. "The Use of Behavioral Maps in Environmental Psychology," Environmental Psychology, edited by Proshansky, Ittelson and Rivlin. New York: Holt, Rinehart and Winston, 1970, pp. 658-668.

Behavior mapping is defined as a very general technique for studying environmental influences on behavior. The mapping of a psychiatric ward is given as an illustrative example.

LeCompte, William F. "The Taxonomy of a Treatment Environment," Archives of Physical Medicine and Rehabilitation, Vol. 53, March 1972, pp. 109-114.

A description of the use of behavior setting research in a hospital. Structural units are defined and used to generate comparison between a) the hospital and a small community, and b) the areas controlled by different types of hospital personnel, and c) the patient and nonpatient sectors of the treatment environment.

Perin, Constance. "Human Studies in the Inception Process," With Man in Mind, Cambridge, Massachusetts: MIT Press, 1970, pp. 70-107.

The study of behavioral systems is proposed as the link between various disciplines. Concentration is given to a discussion of behavioral expectations, behavior circuits as units of analysis, a typology of behavior circuits, urban activity systems, and Barker's behavior settings.

Sommer, Robert and Franklin D. Becker. "Room Density and User Satisfaction," Environment and Behavior, Vol. 3, No. 4, December 1971, pp. 412-417.

This study concludes that it is necessary to develop theories of people in environments rather than of people and environments as separate entities, thus reinforcing Barker's concept of ecological psychology.

2.4. PHENOMENOLOGICAL POSITION

This section contains articles that are essentially phenomenological since they approach the environment as it is experienced. Many of these articles state the basic theory as defined by Osgood's studies of semantic differential and by Kelly's personal construct theory. Others have interpreted this theory for use in environmental design by developing various sets of environmental descriptors.

Calvin, James S., John Dearinger and Mary Ellen Curtin. "An Attempt at Assessing Preferences for Natural Landscapes," Environment and Behavior, Vol. 4, No. 4, December 1972, pp. 447-470.

This investigation was concerned with the problem of assessment of landscape scenery by human observers using photographs and twenty one semantic differential scales. The first two dimensions were natural scenic beauty and natural force which are quite similar to Osgood's evaluative and potency dimensions.

Canter, David. "An Intergroup Comparison of Connotative Dimensions in Architecture," Environment and Behavior, Vol. 1, No. 1, June 1969, pp. 37-48.

A comparison is made between architectural students rating plans and elevations and non-architectural students rating interior perspectives, both using bipolar scales. The major dimensions for the architects were character, coherence and friendliness. The major dimensions for the non-architects were friendliness and coherence.

Canter, David and Ross Thorne. "Attitudes to Housing--A Cross Cultural Comparison," Environment and Behavior, Vol. 4, No. 1, March 1972, pp. 3-32.

In a preliminary stage of a study of cross-cultural attitudes towards housing, a variety of houses were rated on ten bipolar scales by students in Sydney and Strathclyde. The similarity in the use of the procedure in the two groups supports its validity as a cross-cultural test.

Fromm, Erich. "Humanistic Planning," Journal of the American Institute of Planners, Vol. 38, No. 2, March 1972, pp. 67-71.

This article charges that planning has served the aims of an industrialized society rather than the growth and development of man, and points to the mistake of assuming that technological reality and human reality are harmonious. The central task of planning is defined as the resolution of this conflict by means of integrating the system 'man' into the social and organizational system.

Harrison, John and Phillip Sarre. "Personal Construct Theory in the Measurement of Environmental Images: Problems and Methods," Environment and Behavior, Vol. 3, No. 4, December 1971, pp. 351-374.

This paper is concerned with the conceptual and methodological problems involved in the attempt to quantify aspects of the images which individuals have of their environments. This requires a suitable model of the mind, and Kelly's personal construct theory is adapted for this purpose.

Honikman, Basil. "An Investigation of a Method for Studying Personal Evaluation and Requirement of the Built Environment," Proceedings of the Architectural Psychology Conference, Kingston: Kingston Polytechnic and RIBA Publications, 1971, pp. 24-29.

This study examines expectations of environments in terms of concepts like living room, cottage, etc. with pictorial examples of those areas. These were measured on bipolar scales and subjected to principal component and cluster analysis, and were coordinated with a profile of subject personality.

Honikman, Basil. "An Investigation of the Relationship Between Construing of the Environment and its Physical Form," (photocopy of unknown source).

An extension of Kelly's personal construct theory to explain user's adaptation of the environment. The main experiment elicits, constructs, considers laddering to identify relationships, and analyzes using the repertory grid test and the resistance to change and implication grids.

Kasmar, Joyce Vielhauer. "The Development of a Usable Lexicon of Environmental Descriptors," Environment and Behavior, Vol. 2, No. 2, September 1970, pp. 153-169.

A description of the careful development of a set of 66 bipolar environmental descriptors, and a warning against using the Osgood semantic differential since it was not developed to describe physical environments.

Kelly, George A. The Psychology of Personal Constructs. New York: W. W. Norton and Company, 1955, pp. 3-183.

First the concept of constructive alternativism is presented, that man comes to understand his world through an infinite series of successive approximations. This is followed by a statement of the fundamental postulate of the personal construct theory and is elaborated with eleven corollaries. The third chapter has as its purpose the clarification of what is meant by personal constructs, their variations, their everyday uses, their communication, their simple dimensions, their propagation, and their experiential and cultural roots.

Kelly, George A. "A Brief Introduction to Personal Construct Theory," Perspectives in Personal Construct Theory, edited by Bannister. London: Academic Press, 1970, pp. 1-29.

The basic postulates of personal construct theory and its philosophical position and methodological issues are discussed, and the two contrasting philosophical assumptions of accumulative fragmentalism and constructive alternativism are described.

Sanoff, Henry. "Visual Attributes of the Physical Environment," Response to Environment, edited by Coates and Moffet. Raleigh, North Carolina: Student Publication of the School of Design, North Carolina State University, 1969, pp. 37-60.

Twenty semantic differential scales are used to measure four environmental displays of residential environments. Three principle factors were identified: uniqueness--sensousness, perceptual demands, and redundancy.

Sanoff, Henry. "House Form and Preference," EDRA Two, edited by Eastman and Archea. Pittsburgh: Carnegie Mellon University, 1970, pp. 334-339.

In this study low income Negro and middle income white respondents were requested to assess visual displays of designed and non-designed house silhouettes using nineteen semantic differential scales. The findings indicate that both groups agree on their descriptions of an ideal house, but vary considerably in their assessment of the visual displays.

Stringer, Peter. "The Architect is a Man," Architectural Design, August 1970, pp. 411-412.

A consideration of Kelly's personal construct theory and its implications for architecture from a theoretical standpoint, and a specific proposal for further consideration of the process of constructive alternativism.

Stringer, Peter. "Architecture, Psychology, The Games the Same," Architectural Psychology, edited by Canter. London: RIBA Publications, 1970, pp. 7-11.

Stringer discusses the main implications of Kelly's theory for a study of man-environment interactions, personal construct theory, and gives emphasis to the necessity for architects and psychologists to collaborate in the development of a theory of dynamic interaction between man and environment.

3. STATUS OF ENVIRONMENTAL DESIGN THEORY

Current theories of environmental design cover a wide range of ideas and directions. The ones that are of concern here are those related specifically to the question of quality of the environment. Within this there seem to be two dominant areas: the concept of user needs and their accommodation by the environment; and the idea of congruence between environment and desired behavior. This difference may not be important from a conceptual standpoint, but it does focus research in different directions.

The first section in this part contains articles which state general theories of environmental design or concepts of quality. The following section collects articles describing systems of biological or psychological needs and the ways in which the physical environment can be responsive to them.

The final section contains various concepts of congruence or environmental appropriateness, the differences between mental and experiential congruence, and some of the theories which explain congruence. Taken together, these articles on needs satisfaction and congruence constitute the primary directions in the environmental designer's effort to design environments which are more responsive to man.

3.1. THEORY AND QUALITY IN ENVIRONMENTAL DESIGN

This section contains articles which state theories of environmental design or concepts of quality of environment. In both cases the concern is for the user and the extent to which the physical environment facilitates his plans.

Alexander, Christopher. "The Goodness of Fit and Its Source," Environmental Psychology, edited by Proshansky, Ittelson and Rivlin. New York: Holt, Rinehart and Winston, 1970, pp. 42-56; or Notes on the Synthesis of Form. Cambridge, Massachusetts: Harvard University Press, 1964, pp. 15-45.

A statement of the need for fit between form and its context. Form is the part of the world over which the designer has control, and the context puts demands on this form. Fitness is a relationship of mutual acceptability between them.

Canter, David. "Need for a Theory of Function in Architecture," The Architect's Journal Information Library, February 4, 1970, pp. 299-302.

This starts as a plea for the development of a theory of architecture which considers the users of buildings, and the implications of the building on users. It then continues to a consideration of adaptation, privacy and choice.

Iltis, Hugh H., Orie Loucks and Peter Andrews. "Criteria for Optimum Human Environment," Ekistics, Vol. 29, No. 175, June 1970, pp. 449-452.

An anthropological study covering the evolutionary stage of human being and the environment necessary for its survival. Optimum human environment is defined as a compromise between one in which humans have maximum contact with the properties to which they are innately adapted, and a more urban environment in which learned adaptations are relied upon to overcome needs.

Lynch, Kevin and Lloyd Rodwin. "A Theory of Urban Form," Environmental Psychology, edited by Proshansky, Ittelson and Rivlin. New York: Holt, Rinehart and Winston, 1970, pp. 84-100; or Journal of the American Institute of Planners, Vol. 24, No. 4, November 1958, pp. 201-214.

This paper proposes a goal-form theory of urban form. It deals first with the problem of analyzing urban form, secondly with the formulation of goals, and thirdly with the techniques of studying the interrelations between such forms and goals.

Waller, R. A. "Environmental Quality, Its Measurement and Control," Regional Studies, Vol. 4, No. 2, 1970, pp. 177-191.

This paper presents a pragmatic five step process for insuring environmental quality, considering description of the environment, forecasting the effect of changes on people, evaluation of cost and comparing cost and value.

3.2. NEEDS SATISFYING CONCEPTS

Some of the articles in this section describe systems of biological or psychological needs. Others relate these needs to environmental design, some conceptually and others by illustration. Collectively, they constitute one of the major directions in the environmental designers' effort to design environments which are more responsive to man--the direction of needs satisfaction.

Alexander, Christopher. "Major Changes in Environment Required by Social and Psychological Demands," Ekistics, Vol. 28, August 1969, pp. 78-85.

First an examination of various statements of needs; those of Leighton, Malinowski, Maslow and Erikson. This is followed by the examination of twenty urban development goals, each defined in terms of the previous needs concepts, and suggested solution patterns for each.

Cappon, Daniel. "Conceptual Schema for a Study of the Environment," Ekistics, Vol. 34, No. 200, July 1972, pp. 6-12.

A conceptual schema which is based on ten bio-social imperatives compared with the simpler structure of A. H. Maslow's hierarchy of needs. Differences in scale change the environmental response to these imperatives.

Dubos, Rene. "The Biological Basis of Urban Design," Ekistics, Vol. 35, No. 209, April 1973, pp. 199-204.

A description of some fundamental needs which are shared by all human beings, irrespective of time and place; and a discussion of some of the aspects of urban life relating to perception of physical space, human relationships, and self creation of personality.

Haythorn, William W. "A Need by Sources of Satisfaction Analysis of Environmental Habitability," Ekistics, Vol. 30, No. 178, September 1970, pp. 200-202.

This paper presents a comparison of and extension of Maslow's hierarchy of needs and Doxiades' Ekistics grid with each need being examined to determine its potential satisfaction at various scales of the environment.

Maslow, A. H. "Toward a Humanistic Biology," Architectural Design, November 1971, pp. 704-709.

A presentation of humanistic psychology as an extension of behaviorism and Freudian psychoanalysis and a criticism of the value free, value avoiding model of science which has been inherited from the physical sciences. Technology must be considered a means rather than an end in itself, and science must accept the responsibility for determining desired states.

Olivegren, Johannes. "A Better Sociopsychological Climate in Our Housing," Proceedings of the Architectural Psychology Conference, Kingston. Kingston Polytechnic, 1971, pp. 65-69.

A consideration of the social and psychological needs of privacy and contact with people, and the way in which the design of housing estates can affect them.

Osmond, Humphry. "Function as the Basis of Psychiatric Ward Design," Environmental Psychology, edited by Proshansky, Ittelson and Rivlin. New York: Holt, Rinehart and Winston, 1970, pp. 560-569.

Mentally ill people have been studied quite closely and it is possible to define their needs very exactly. This paper presents these needs and the specific ways in which the environment should be designed to accommodate them.

Scott, James. "Psychological Need and Housing Design," Proceedings of the Architectural Psychology Conference, edited by Honikman. Kingston: Kingston Polytechnic, 1971, pp. 79-81.

An examination of needs in housing based on the concept that everyone wants to be recognized and treated as an individual and that this has implications for housing.

Stagner, Ross. "Perceptions, Aspirations, Frustrations, and Satisfactions: An Approach to Urban Indicators," Ekistics, Vol. 30, No. 178, September 1970, pp. 197-199.

This article urges the development of social indicators based on the aspirations of urban dwellers, the frustrations they perceive and satisfactions they report, all within the context of Maslow's hierarchy of needs.

3.3. ACTIVITY - ENVIRONMENT CONGRUENCE

The articles in this section relate to the second major effort in environmental design to improve the responsiveness of the environment to human needs, in this case by attaining and maintaining congruence between activities or behavior systems and the physical environment. Various aspects of this concept of congruence are explored.

Canter, David V. "The Place of Architectural Psychology," Proceedings of the Architectural Conference, edited by Honikman. Kingston: Kingston Polytechnic, 1971, pp. 3-6.

This article proposes the concept of environmental appropriateness as an alternative to user needs. This has the advantage of being more open ended and avoids some of the limitations of the user need approach.

Foley, Donald. "An Approach to Metropolitan Spatial Structure," Explorations into Urban Structure, edited by Webber. Philadelphia: University of Pennsylvania Press, 1964, pp. 21-40.

A conceptual view of metropolitan structure which examines normative and cultural aspects, functional organizational aspects, and physical aspects in both their aspatial and spatial dimensions. The concept of congruence is implicit.

Lerup, Lars. "Environmental and Behavioral Congruence as a Measure of Goodness in Public Space: The Case of Stockholm," Ekistics, Vol. 34, No. 204, November 1972, pp. 341-358.

The observational techniques of Barker and Michelson's concept of congruency form the basis of this study of two existing situations in the city of Stockholm.

Michelson, William. "Urban Sociology as an Aid to Urban Physical Development: Some Research Strategies," Journal of the American Institute of Planners, Vol. 34, March 1968, pp. 105-108.

After describing the sociologist's contribution to improving physical development, there is a conceptual statement exploring the differences and implications of mental congruence, the attitude of an individual toward a particular environment, and experiential congruence, how the environment actually accommodates behavior.

Perin, Constance. "Concepts and Methods for Studying Environments in Use," (photocopy, unknown source).

A brief presentation of Barker's behavior setting theory and an exploration of the adaptation costs which accompany incongruency between activities and the physical environment. A pilot study which focuses on this adaptation process is presented.

Steinitz, Carl. "Meaning and Congruence of Urban Form and Activity," Journal of the American Institute of Planners, July 1968, pp. 233-248.

In this article, congruence between form and activity is examined in detail with research to determine how environments communicate the type of activity, relative activity intensity and comparative significance of places. It is concluded that congruence is an important factor in the meaningfulness of places.

Wicker, Allan W. "Precesses Which Mediate Behavior-Environment Congruence," Behavioral Science, Vol. 17, May 1972, pp. 265-277.

First there is an examination of various ways of conceiving the environment; as physical features, networks of social roles, or as behavior setting units. Then there is a consideration of some of the theories which explain why there is congruence between behavior and environment; operant learning, observational and instructional learning, behavior setting theory and social exchange theory.

4. THE PHYSICAL ENVIRONMENT AND HUMAN INTERACTION

The affect of the physical environment on interaction patterns has been part of the mainstream of environment and behavior studies for the last twenty five years. It gave rise to the debate about environmental determinism, described earlier in this bibliography, which is still continuing today. It is still an aspect of environment-behavior studies which seems most critical. The probable usefulness of this research direction to environmental designers is apparent.

The first section in this part contains various statements of the interaction between the physical environment and human behavior. The second section contains studies of proxemics, personal space and privacy. These studies all have in common a concern for the interpersonal distances maintained between men, and the way in which these relationships are affected by the environment and by cultural differences.

In contrast, the third section contains studies based on the concept of territoriality derived primarily from ethological studies. These focus on the apparent need to define and defend physical territory. They are grouped separately because of this difference from those focusing on interpersonal space although the literature is somewhat ambiguous on this point.

The final section includes specific case studies dealing with the affect of propinquity on interaction patterns. Some of these are certainly deterministic in philosophy and should be considered in conjunction with the previous sections on environmental determinism and behaviorism.

4.1. GENERAL STATEMENTS AND STUDIES

This section contains various examinations of the interaction between the physical environment and human behavior. The more specific studies focusing on proxemics, territoriality and propinquity are contained in other sections. The debate about environmental determinism is found in Section 1.3.

Carroll, Robert, Hayden May and Samuel V. Noe, Jr. University-Community Tension and Urban Campus Form. New York: Educational Facilities Laboratory, 1972, pp. 1-78.

A report of a research project which investigated the affect of the form of the university on its relations with its surrounding community. Special attention was given to the affect of size, difference in interests, power balance, rate of change and form in both case studies and mailed questionnaires.

Kriesburg, Louis. "Neighborhood Setting and the Isolation of Public Housing Tenants," Journal of the American Institute of Planners, January 1968, pp. 43-49.

An analysis of the extent to which social isolation between project tenants and residents of surrounding areas exists and is affected by socioeconomic differences and physical barriers.

Preiser, Wolfgang. "The Use of Ethological Methods in Environmental Analysis: A Case Study," (photocopy, unknown source).

A basic review of studies on human spatial behavior including territory and dominance, personal space, proxemics and naturalistic studies followed by a case study of a university campus.

Proshansky, Harold, William Ittelson and Leanne Rivlin. "Freedom of Choice and Behavior in a Physical Setting," Environmental Psychology, New York: Holt, Rinehart and Winston, 1970, pp. 173-183.

A discussion of the concept of privacy, territoriality and crowding and their relationship to freedom of choice as a unifying concept.

Schorr, Alvin L. "Housing and Its Effects," Environmental Psychology, edited by Proshansky, Ittelson and Rivlin. New York: Holt, Rinehart and Winston, 1970, pp. 319-333.

Three aspects of the effect of housing on its residents are examined in detail: 1) House and neighborhood in terms of self perception, stress, health and satisfaction; 2) physical housing, particularly crowding and layout; and 3) neighborhood effects on social and family relationships.

4.2. PROXEMICS, PERSONAL SPACE AND PRIVACY

These studies focus on the desire for various levels of interaction with other people, as opposed to the specific affect of the environment on that interaction. What distances man maintains from other men and the various aspects of privacy are presented.

Alexander, Christopher. "The City as a Mechanism for Sustaining Human Contact," Environment for Man, edited by Ewald. Bloomington: Indiana University Press, 1967, pp. 60-102.

This is an example of environmental design based on behavioristic ideas. In this case twelve physical characteristics are identified that will support intimate contacts, and a hypothetical environment is designed with those characteristics, the assumption being that the environment will insure the goal.

Hall, Edward T. "A System for the Notation of Proxemic Behavior," American Anthropologist, Vol. 65, 1963, pp. 1003-1027.

A presentation of a simple system of observation and notation of micro-cultural events with an emphasis on differences between cultures.

Hall, Edward T. "The Anthropology of Space: An Organizing Model," Environmental Psychology, edited by Proshansky, Ittelson and Rivlin. New York: Holt, Rinehart and Winston, 1970, pp. 16-27; or The Hidden Dimension, Garden City, New York: Doubleday and Co., 1966, pp. 85-122.

This study of proxemics focuses on normal interpersonal distances, particularly intimate, personal, social and public distances in various spatial environments.

Marshall, Nancy. "Environmental Components of Orientation Toward Privacy," EDRA Two, edited by Eastman and Archea. Pittsburgh: Carnegie-Mellon University, 1970, pp. 246-251.

Orientations toward privacy were identified and individual differences in orientation assessed by means of a privacy preference scale. The following six subscales were constructed from principal component analysis: preferences for non-involvement with neighbors, seclusion of home, solitude, privacy with intimates, anonymity and reserve.

Schwartz, Barry. "The Social Psychology of Privacy," American Journal of Sociology, Vol. 73, No. 6, May 1968, pp. 741-752.

Privacy is examined as a withdrawal from interaction in the social system. The report ends with a discussion of identify and its relation to the freedoms of engagement and disengagement.

Sloan, Sam A. "Clerks Are People," Ekistics, Vol. 34, No. 204, November 1972, pp. 359-366.

A test case focused on assimilation of behavior criteria, particularly sociability, aggression and territoriality, into the design process through the use of Hall's proxemic notation system.

Sommer, Robert. "Spatial Behavior," Personal Space, Englewood Cliffs, New Jersey: Prentice-Hall, 1969, pp. 3-73.

This part of the book presents a charge for design professionals to adopt a functionalism based on user behavior as a guiding principle. This is followed by discussions of 'personal space' as a spacing concept and as an aspect of individuality. The limitations of the single variable laboratory model are mentioned.

Sommer, Robert. "The Ecology of Privacy," Environmental Psychology, edited by Proshansky, Ittelson and Rivlin. New York: Holt, Rinehart and Winston, 1970, pp. 256-266.

A report of a series of observational, questionnaire and experimental studies directed at learning how readers found privacy in public reading areas of a university library with related discussions on territoriality and personal space.

Stockols, Daniel. "A Social-Psychological Model of Human Crowding Phenomena," Journal of the American Institute of Planners, Vol. 38, No. 2, March 1972, pp. 72-83.

Four basic lines of behavioral research related to crowding are outlined and criticized for their lack of theoretical perspective and their concentration on spatial rather than social-psychological aspects. This is followed by a proposal for a conceptual framework for the analysis of human crowding.

4.3. TERRITORIALITY AND ETHOLOGY

These studies are based primarily on ethology, the study of animal behavior in environments. The aspect most directly related to environmental design is the concept of territoriality.

Altman, Irwin and William W. Haythorn. "The Ecology of Isolated Groups," Environmental Psychology, edited by Proshansky, Ittelson and Rivlin. New York: Holt, Rinehart and Winston, 1970, pp. 226-239; or Behavioral Science, Vol. 12, 1967, pp. 169-182.

This study reports on social activity and territoriality behavior of isolated and confined groups with controls for groups personality composition.

Greenbie, Barie. "Some Implications for Urban Design from Studies of Animal Behavior," EDRA Two, edited by Eastman and Archea. Pittsburgh: Carnegie Mellon University, 1970, pp. 366-371.

A discussion of the territoriality aspects of animal behavior and how it relates to human behavior and how it affects self identity.

Greenbie, B. B. "What Can We Learn From Other Animals? Behavioral Biology and the Ecology of Cities," Journal of the American Institute of Planners, Vol. 37, No. 3, May 1971, pp. 162-168.

This paper studies the concepts of ethology that may be relevant for land planning and includes evaluations of concepts such as individual's territory, new definitions of private and public property, and land use and activity patterns.

Griffin, Robert M., Jr. "Ethological Concepts for Planning," Journal of the American Institute of Planners, Vol. 35, No. 1, January 1969, pp. 54-60.

This review article relates the science of ethology to the responses of human beings to their environments. It summarizes the mechanisms and characteristics of behavior of different species and suggests that a rational planning model must consider a biological or biocultural model of man that takes into consideration the full range of transactions with the environment.

Roos, Philip D. "Jurisdiction: An Ecological Concept," Environmental Psychology, edited by Proshansky, Ittelson and Rivlin. New York: Holt, Rinehart and Winston, 1970, pp. 239-246; or Human Relations, Vol. 21, 1968, pp. 75-84.

A comparison of territorial behavior which maximized control over space to enhance positive values, and jurisdiction which is generally forced on to an individual by the nature of the social surroundings.

4.4. PROPINQUITY CASE STUDIES

This section focuses on the concept of propinquity and its affect on human interaction patterns. Some of the articles debate the importance of propinquity, others relate case studies pertinent to the question. Other articles which are related are located in Section 1.3 Environmental Determinism and Section 4.1 General Statements and Studies.

Festinger, Leon, Stanley Schachter and Kurt Back. Social Pressures in Informal Groups: A Study of Human Factors in Housing. Stanford: Stanford University Press, 1950.

A single family detached housing area and an apartment complex are studied to determine which aspects of the physical environment influenced friendship formation and opinions of residents in those areas.

Gans, Herbert. "Planning and Social Life, Friendship and Neighbor Relations in Suburban Communities," Journal of the American Institute of Planners, Vol. 27, No. 2, May 1961, pp. 134-140; or People and Plans, New York: Basic Books Incorporated, 1968, pp. 152-165.

This article reviews the relative affect of homogeneity of residents and proximity or propinquity in regard to friendship and neighbor relations.

Gutman, Robert. "Site Planning and Social Behavior," Environmental Psychology, edited by Proshansky, Ittelson and Rivlin. New York: Holt, Rinehart and Winston, 1970, pp. 509-517; or Journal of Social Issues, Vol. 22, October 1966, pp. 103-115.

An examination of the process through which site plans influence behavior, and the kinds of behavior influenced.

Kupar, Leo. "Neighbor on the Hearth," Environmental Psychology, edited by Proshansky, Ittelson and Rivlin. New York: Holt, Rinehart and Winston, 1970, pp. 246-255.

Several different aspects of a housing estate are examined to determine their affect on friendship patterns: party wall neighbors with sound insulation problems, side neighbors with a common walk, and the effects of cul-de-sacs on privacy from doors and windows.

Michelson, William. "Determinism by the Urban Environment," Man and His Urban Environment, Reading, Massachusetts: Addison-Wesley Publishing Company, 1970, pp. 168-190.

This chapter presents a thorough review of the propinquity case studies: Festinger, Kuper, Caplow and Foreman, Merton, and Whyte, and an analysis of situations in which propinquity has some influence.

Whyte, William H. "The Web of Friendship," Organization Man, Garden City, New York: Doubleday, 1957, pp. 365-386.

This study of Park Forest, a residential community, suggests that the friendship patterns created by spatial determinism last over relatively long periods of time.

Yancey, William L. "Architecture, Interaction, and Social Control: The Case of a Large Scale Public Housing Project," Environment and Behavior, Vol. 3, No. 1, March 1971, pp. 3-21.

The first part of this article reviews the various studies related to the affect of proximity on social interaction. It then focuses on a case study of the Pruitt-Igoe housing project in St. Louis.

5. THE ROLE OF PERCEPTION AND COGNITION

The way in which man perceives his physical environment has been the basis for theories of design throughout history. Prior to the last five years, it was the aspect of what we now consider environmental psychology which was given the most credence. This was partly because of the traditional importance placed on the visual aspects of the environment by designers, and partly because it was possible to deal with perception more empirically than some other psychological variables.

The articles in the first section of this part show that there is still considerable work directed at increasing our understanding of the role of perception. Much of it is directed at learning the importance of non-physical variables in perception, and the relationship to the phenomenological theories described earlier in the bibliography.

The rest of the articles on perception and cognition are collected into two sections: those concerned with finding a reasonable level of environmental stimulation, and the questions of complexity and ambiguity; and those dealing with the problems of imageability and schema. As a total they represent the main directions of current studies in environmental perception.

5.1. GENERAL PERCEPTION AND COGNITION

This section contains articles on the role of perception of the urban environment, environmental design criteria based on cognitive goals, comprehensibility, constancy in perception and subliminal perception. More specific articles dealing with complexity in environmental stimulation and imageability are contained in subsequent sections.

Appleyard, Donald. "Notes on Urban Perception and Knowledge," EDRA Two, edited by Eastman and Archea. Pittsburgh: Carnegie Mellon University, 1970, pp. 97-101.

Three types of urban perception are proposed: operational, referring to roles; responsive, such as images related to physical characteristics; and inferential, related to symbols and expectations.

Carr, Stephen. "The City of the Mind," Environment for Man, edited by Ewald. Bloomington: Indiana University Press, 1967, pp. 197-231.

This article proposes a set of nine criteria for environmental form based on man's need to understand the environment and to be stimulated by it. This is preceded by a general discussion of psychological needs and environmental design.

Craik, Kenneth H. "Comprehension of the Everyday Physical Environment," Environmental Psychology, edited by Proshansky, Ittelson and Rivlin. New York: Holt, Rinehart and Winston, 1970, pp. 646-658; or Journal of the American Institute of Planners, Vol. 34, January 1968, pp. 29-37.

This early article encourages research in environmental psychology directed at learning how people come to grasp cognitively the everyday physical world. It considers an environmental display approach to this research and explores such variables as observer differences, response formats, and validation criteria.

Harrison, James D. An Annotated Bibliography on Environmental Perception with Emphasis on Urban Areas, Monticello, Illinois: Council of Planning Librarians, 1969.

A partially annotated bibliography in five sections: 1) space, culture and personality; 2) decision making and resource management; 3) city planning and the critic; 4) the sensuous form of cities; and 5) personality and perception.

Ittelson, William H. "The Constancies in Perceptual Theory," Environmental Psychology, edited by Proshansky, Ittelson and Rivlin, New York: Holt, Rinehart and Winston, 1970, pp. 112-120.

This paper presents a conceptualization which stresses the importance of constancy in making effective behavior possible, and the psychological mechanism by which constancy is achieved.

Lowenthal, David. "Research in Environmental Perception and Behavior," Environment and Behavior, Vol. 4, No. 3, September 1972, pp. 333-342.

This article reviews the current research on environmental perception and behavior with a focus on the problem of definition and scope, the difficulty in distinguishing between social and physical environments, and problems of technique and method.

Sandstrom, Carl I. "What Do We Perceive in Perceiving?," Ekistics, Vol. 34, No. 204, November 1971, pp. 370-371.

Two aspects of perception are described; a phenomenal one involving the awareness of events presently occurring in the immediate surroundings, and a responsive aspect entailing discriminative response to environmental stimuli.

Smith, Peter F. "The Pros and Cons of Subliminal Perception in the Built Environment," Ekistics, Vol. 34, No. 204, November 1972, pp. 367-369.

A psycho-physiological study of neural systems pointing to the importance of subliminal perception--unconsciously perceived, needing very little stimulus from the environment and insuring that response to the environment is balanced.

5.2. DEGREE OF ENVIRONMENTAL STIMULATION

The articles in this section are all concerned with finding a reasonable level of environmental stimulation. They deal with the effects of stimulus reduction, complexity, the tension between need for understanding and ambiguity, and sensory overload.

Lilly, John C. "Mental Effects of Reduction of Ordinary Levels of Physical Stimuli on Intact, Healthy Persons," Environmental Psychology, edited by Proshansky, Ittelson and Rivlin, New York: Holt, Rinehart and Winston, 1970, pp. 220-226.

A review of autobiographical accounts of natural stimulus reduction is compared with accounts of experimental isolation to determine similarities in mental effects.

Rapoport, Amos and Robert E. Kantor. "Complexity and Ambiguity in Environmental Design," Journal of the American Institute of Planners, Vol. 33, No. 4, July 1967, pp. 210-221.

Simplicity and clarity in the intent of environmental design is questioned from a number of points of view. Recent psychological research shows that people prefer ambiguous, complex patterns in their visual fields. The article concludes that there is an optimal range of perceptual input.

Rapoport, Amos and R. Hawkes. "The Perception of Urban Complexity," The Journal of the American Institute of Planners, Vol. 36, No. 2, March 1970, pp. 106-111.

The concept of complexity is defined in terms of urban perception. The definition is based on a concept of maximum rate of usable information, which allows for the social and cultural setting as well as for learning. Research and design applications of complexity are suggested.

Rapoport, Amos. "Designing for Complexity," Architectural Association Quarterly, Vol. 3, Winter 1971, pp. 29-33.

The author reviews his two previous articles, "Complexity and Ambiguity in Environmental Design," and "The Perception of Urban Complexity," and elaborates on some of the major differences between them. He then suggests what this approach may mean for urban design.

Smith, Peter F. "Mind and Metropolis," Built Environment, Vol. 1, No. 2, May 1972, pp. 135-136.

A consideration of tension levels in biological and psychological systems leads to a conclusion that, in order to satisfy psychological needs, images, fantasies and shock should be part of the urban physical environment.

Smith, Peter F. "Transactions Between Mind and the Urban Environment," Architectural Design, February 1973, pp. 78-79.

A discussion of the need for a stimulating and exciting physical environment since urban monotony can impair the capacity to perceive, and a suggestion that urban environments incorporate variability, flexibility and stimulation.

Venturi, Robert. Complexity and Contradiction in Architecture, New York: Museum of Modern Art, 1966, pp. 22-30.

A manifesto encouraging the concept of ambiguity in the physical environment and complexity and contradiction rather than simplification or picturesqueness.

Wohlwill, Joachim F. "The Physical Environment, A Problem for a Psychology of Stimulation," Journal of Social Issues, Vol. 22, No. 4, October 1966, pp. 29-38.

A review of the concept of stimulation with special attention given to the dimensions of novelty, complexity, variation, surprise and incongruity, and an analysis of a concept of optimal level of stimulation and the question of long term adaptation.

Wohlwill, Joachim F. "The Concept of Sensory Overload," EDRA Two, edited by Eastman and Archea. Pittsburgh: Carnegie Mellon University, 1970, pp. 340-344.

This is an overview of the literature about sensory overload, especially studies by Zuckerman, Glass and Saplikowski. The studies provide testimony of the ability of the human individual to tolerate overlapping stimulation amounting to overload, and to respond adaptively.

5.3. IMAGEABILITY

The articles in this section are all concerned with the mental images or schema that urban inhabitants have of their environments. Most build on the early work of Kevin Lynch and use free recall maps for data. Many extend Lynch's work by considering social or cultural differences, or meaning as opposed to perceptual imagery.

Appleyard, Donald. "Why Buildings Are Known," Environment and Behavior, Vol. 1, No. 2, December 1969, pp. 131-156.

A report of a study of Ciudad Guayana using free verbal recall, free map recall and free trip recall for comparative data. Attributes of form, visibility and significance were consistent regardless of the data type, with considerable support for Steinitz's concept for congruence.

DeJonge, Derk. "Images of Urban Area: Their Structures and Psychological Foundations," Journal of the American Institute of Planners, November 1962, pp. 266-276.

A test of the imageability of several towns in the Netherlands using Lynch techniques, under the assumption that one of the conditions for the effective use of urban space is that residents and visitors should be able to find their way about with ease, or without great effort.

Harrison, James D. and William A. Howard. "The Role of Meaning in the Urban Image," Environment and Behavior, Vol. 4, No. 4, December 1972, pp. 389-411.

This study focuses on meaning as opposed to imagery, and considers paths, districts, nodes and landmarks in terms of physical components; location and appearance; and cultural components; meaning and association. It concludes that location and meaning are the most significant.

Ladd, Florence G. "Black Youths View Their Environment: Neighborhood Maps," Environment and Behavior, Vol. 2, No. 1, June 1970, pp. 74-99.

This is an analysis of neighborhood maps drawn by black adolescents in Boston; four groups of maps are described: pictorial, schematic, diagrammatic, and map-like, with little relationship to subjects' age, school level or length of residence.

Lee, Terrence. "Urban Neighborhood as a Socio-Spatial Schema," Environmental Psychology, edited by Proshansky, Ittelson and Rivlin. New York: Holt, Rinehart and Winston, 1970, pp. 349-370; or Human Relations, Vol. 21, No. 3, 1968, pp. 241-268; or Ekistics, Vol. 30, No. 177, August 1970, pp. 119-129.

This article presents a discussion of the neighborhood as a physical or social phenomena, a typology of schema, the correspondence between schema and social behavior, the affect of housing density, and the development of a neighborhood quotient scale.

Lynch, Kevin. "The City Image and Its Elements," The Image of the City, Cambridge: MIT Press, 1960, pp. 46-90.

This classic work on imageability is limited to the effect of physical, perceptible objects, and classifies the content of city images into five types of elements: paths, edges, districts, nodes and landmarks. These elements are then examined in terms of their interrelation and quality.

Maurer, Robert and James C. Baxter. "Images of the Neighborhood and City Among Black, Anglo and Mexican-American Children," Environment and Behavior, Vol. 4, No. 4, December 1972, pp. 351-388.

This was a study of children's images and builds on other children's studies by Ladd and Blaut. Lynch's categories were not used but the map drawing data collection technique was. Children didn't seem to be limited by the map technique.

6. DIVERSITY AND CHANGE IN THE ENVIRONMENT

The basic premise of this concluding part is that the desired diversity of the physical environment outlined in the previous part and the concept of satisfying human needs in the environment can be combined. The desired level of visual stimulation can be satisfied if environmental designers can develop the capacity of dealing with needs in a more detailed and explicit manner.

This assumes that the population is heterogeneous in terms of social characteristics, and that this heterogeneity is desirable. The first section of this part presents the arguments for and against this question of homogeneity vs. heterogeneity. The second section contains articles which identify the kinds of differences between people which can be considered by environmental designers - social and cultural differences, personality and preference differences - and illustrative case studies.

The initial congruence between activities and the physical environment can be achieved by very specific design responsive to the socio-psychological characteristics of a sub-population, or by offering choice from a variety of environmental alternatives. In either case, in order to maintain this congruence over time, the environment must be adaptable. The final section includes some of the arguments for environmental adaptability--to satisfy changing needs or to provide for self expression.

6.1. GENERAL ARGUMENT

This section presents some of the arguments for and against the concept of diversity and heterogenity in the physical environment from the standpoint of meeting human needs. Subsequent sections deal more specifically with variation in life and personality, and the need for adaptability.

Gans, Herbert. "The Balanced Community: Homogeneity or Heterogeneity in Residential Areas," Journal of the American Institute of Planners, Vol. 27, No. 3, August 1961, pp. 176-184; or People and Plans. New York: Basic Books, 1968, pp. 166-182.

The arrangements for social heterogeneity and against homogeneity are examined to arrive at a statement urging an appropriate balance, but with a warning that population heterogeneity cannot be achieved until the basic metropolitan area social problems are solved.

Hendricks, Francis and Malcolm MacNair. "Concepts of Environmental Quality Standards Based on Life Styles," Ekistics, Vol. 30, No. 177, August 1970, pp. 139-144.

This article urges that urban residential places of an appropriate unit size should have a characteristic structure closely associated with the life styles of the people who inhabit them, the proposal being to broaden the range of variety through dispersal of residential enclaves with distinguishing characteristics.

Keller, Suzanne. "Implications for Planning the Human Environment," The Urban Neighborhood, New York: Random House, 1968, pp. 149-164.

This summary chapter of the book urges that planners be sensitive to the social and personality characteristics of their clients, and concludes that the fixed concept of a neighborhood unit should be rejected in favor of trying to determine the actual desires of a heterogeneous population and then designing environments which reflect those preferences.

Mead, Margaret. "What Kind of Fit?," Ekistics, Vol. 31, No. 186, May 1971, pp. 329-330.

This article stresses the values of a richly varied micro-environment, and asks for consideration of how much of the traditional difference between peoples of different cultures we should deliberately try to conserve in the world.

6.2. VARIATION IN LIFE STYLES AND PERSONALITIES

This section contains a variety of articles which deal with the differences among people which should be considered by the environmental designer and which can find expression in the physical environment. It includes description of social and cultural differences, personality differences, studies of preferences, and case studies illustrating the ways these differences can be expressed physically.

Brolin, Brent C. and John Zeisel. "Mass Housing: Social Research Design," Architectural Forum, July-August 1968, pp. 66-71.

This study illustrates clearly the ways in which data about social behavior can be used to design environments which are more suitable and accommodating. It is based on Gan's study of working class Italian life in Boston, and designs housing to fit the observations and conclusions of that study.

Fried, Marc and Peggy Gleicher. "Some Sources of Residential Satisfaction in an Urban Slum," Environmental Psychology, edited by Proshansky, Ittelson, and Rivlin. New York: Holt, Rinehart and Winston, 1970, pp. 333-346.

This study illustrates clearly some of the major differences in concepts of desired residential environments between slum residents and the middle class, differences in social networks and the physical environment as an extension of the home.

Lamanna, Richard A. "Value Consensus Among Urban Residents," Journal of the American Institute of Planners, Vol. 36, November 1964, pp. 317-323.

A study based on the contention that social science research can identify attitudes, cultural style and conceptions of life which should be considered by the planner. It identifies areas of consensus and differences in values.

McKechnie, George. "Measuring Environmental Disposition with the Environmental Response Inventory," EDRA Two, edited by Eastman and Archea. Pittsburgh: Carnegie Mellon University, 1970, pp. 320-326.

A report of research that concludes that environmental psychology must take into consideration the environmental dispositions - the configurations of attitudes, beliefs, values and sentiments - of the people whose environmental behavior are being studied and whose future environmental responses are being predicted.

Michelson, William. "Social Insight to Guide the Design of Housing for Low Income Families," Ekistics, Vol. No. 149, April 1968, pp. 252-255.

Five characteristics of people---stage in the life cycle, family pattern, life style, values and local customs---are outlined which offer insight into the design of low income housing.

Michelson, William. "The Urban Environment," Man and His Urban Environment, Reading, Massachusetts: Addison-Wesley Publishing Company, 1970, pp. 61-167.

A comprehensive review of the social and cultural variables which should be considered in the design of the physical environment, organized into chapters dealing with life style, stage in life cycle, social class, values and pathology.

Waterhouse, Alan. "Dominant Values and Urban Planning Policy," Journal of the Town Planning Institute, Vol. 57, No. 1, January 1971, pp. 9-14.

This article examines the role which dominant values play in determining the individual's response to physical environmental stimuli, and develops a value characteristics profile which links value orientations and response to environment.

Werkerle, Gerda and Edward Hall. "High Rise Living: Can the Same Design Serve Young and Old?," Ekistics, Vol. 33, No. 196, March 1972, pp. 186-191.

A case study which compares the response of young people and elderly people to the same high rise housing development in Chicago, and concludes that age, social needs and expectations, stage in life cycle and life style are all variables which affect satisfaction with an environment.

Winkle, Gary, Roger Malek and Philip Thiel. "The Role of Personality Differences in Judgements of Roadside Qaulity," Environment and Behavior, Vol. 1, No. 2, December 1969, pp. 199-223.

This article first reviews the literature relating personality to environmental preferences, and then, develops an environmental personality scale which is compared with Osgood's semantic differential scale.

Zehner, Robert B. "Research Report: Neighborhood and Community Satisfaction in New Towns and Less Planned Suburbs," Journal of the American Institute of Planners, Vol. 37, No. 6, November 1971, pp. 379-385.

Using results from interviews with residents in two highly planned new towns and two minimally planned but otherwise comparable suburban communities, this report compares several measures of neighborhood and community satisfaction and attraction, an illustration of the diversity of values.

6.3. ENVIRONMENTAL ADAPTABILITY

This section contains several articles which argue for more flexible, open ended design either because of individual's needs for self expression, or to accommodate changing needs over time, and an example of a housing development proposal which illustrates this flexibility.

Alexander, Christopher, et. al. Houses Generated by Patterns, Berkeley: Center for Environmental Structure, 1969, pp. 5-50.

This is a report of Alexander's competition submission for housing in Peru. The proposal develops an overall system of community organization and a building system which allows considerable choice and decision making on the part of the resident at the time of building, and the flexibility to change and modify the environment as their requirements change through time.

Ehler, Charles N. "Urban Design Systems: Towards an Ecological Re Think," American Behavioral Science, Vol. 14, No. 6, July-August 1971, p. 791.

Strong criticism of the traditional methods of urban planning and design which take an approach which attempts to exhaustively represent all relationships in a given environment and to impose a closed framework upon that environment, and a proposal for systems which are open ended and regenerative.

Rapoport, Amos. "Personal Element in Housing: An Argument for Open Ended Design," RIBA Journal, Vol. 75, July 1968, pp. 300-307.

A criticism of contemporary housing which seriously inhibits the individual's needs for self expression, and a proposal for a policy of open ended design that will answer a wide range of requirements.

UNANNOTATED BOOKS, JOURNAL ISSUES AND CONFERENCE-UNANNOTATED BOOKS, JOURNAL ISSUES AND CONFERENCE PROCEEDINGS

Alexander, Christopher. Notes on the Synthesis of Form. Cambridge: Harvard University Press, 1964.

Archea, John and Charles Eastman. Proceedings of the EDRA Two. Pittsburgh: Carnegie-Mellon University, 1970.

Bailey, R., C. W. Taylor and C.H.H. Branch, eds. Second National Conference on Architectural Psychology.[x] Salt Lake City: University of Utah, 1967.

Bannister, D., ed. Perspectives in Personal Construct Theory. London: Academic Press, 1970.

Barker, Roger. Ecological Psychology. Stanford: Stanford University Press, 1968.

Bell, Gwen and Paula MacGreevey. Behavior and Environment: A Bibliography of Social Activities in Urban Space. Monticello, Illinois: Council of Planning Librarians Bibliography No. 123, 1970.

Bell, Gwen and Jaqueline Tyrwhitt. Human Identity in the Urban Environment.[X] London: Penguin Books, September 1972.

Blackman, Allan, ed. Environment and Behavior (Special Issue), American Behavioral Scientists, Vol. 10, September 1966.

Bolan, Richard S., ed. Psychology and Urban Planning: Perception, Behavior and Environment (Special Issue), Journal of the American Institute of Planners, Vol. 38, March 1972.

Broady, Maurice. Planning for People. London: Bedford Square Press, 1968.

Canter, David V., ed. Architectural Psychology. London: RIBA Publication, 1970.

Coates, G. J. and K. M. Moffett, eds. Response to Environment, Student Publication of the School of Design, Vol. 18, Raleigh, North Carolina: North Carolina State University, 1969.

Cooper, Clare. Some Social Implications of House and Site Plan Design at Easter Hill Village: A Case Study.[X] Berkeley: University of California Center for Planning and Development Research, September 1965.

Ewald, William R., Jr., ed. Environment for Man. Bloomington: Indiana University Press, 1967.

Festinger, Leon, Stanley Schachter and Kurt Back. Social Pressures in Informal Groups. New York: Harper Bros., 1950.

Gans, Herbert J. People and Plans. New York: Basic Books, 1968.

Gans, Herbert J. The Levittowners: Ways of Life and Politics in a New Suburban Community. New York: Random House, [illegible].

Goffman, Erving. Behavior in Public Places. Garden City, New York: Doubleday-Anchor Books, 1963.

Goodman, Robert. After the Planners. London: Penguin Books, 1972.

Hall, Edward T. The Silent Language. Garden City, New York: Doubleday, 1959.

Hall, Edward T. The Hidden Dimension. Garden City, New York: Doubleday, 1966.

Harrison, James D. An Annotated Bibliography on Environmental Perception with Emphasis on Urban Areas. Monticello, Illinois: Council of Planning Librarians Bibliography No. 93, August 1969.

Honikman, Basil, ed. Architectural Psychology 1970. London: RIBA Publications, 1972.

Kates, R. W. and J. F. Wohlwill, eds. Man's Response to the Physical Environment (Special Issue), Journal of Social Issues, Vol. 22, October 1966.

Kelly, George. The Psychology of Personal Constructs. New York: W. W. Norton, 1955.

Kneese, A. V. and B. J. Bower, eds. Environmental Quality Analysis: Theory and Method in the Social Sciences.[x] Baltimore: Johns Hopkins Press, 1972.

Lynch, Kevin. The Image of the City. Cambridge: MIT Press, 1960.

Lynch, Kevin. What Time is This Place?[x] Cambridge: MIT Press, 1973.

Maslow, Abraham H. Toward a Psychology of Being.[x] New York: D. Van Nostrand, 1962.

Michelson, William. Man and His Urban Environment. Reading, Massachusetts: Addison-Wesley, 1970.

Moore, T. Garry, ed. Emerging Methods in Environmental Design and Planning. Cambridge: MIT Press, 1970.

Osgood, C., G. J. Suci and P. H. Tannenbaum. The Measurement of Meaning.[x] Urbana, Illinois: University of Illinois Press, 1957.

Perin, Constance. With Man in Mind - An Interdisciplinary Prospectus for Psychology. New York: Holt, Rinehart and Winston, 1970.

Proshansky, H. M., W. H. Ittelson and L. G. Rivlin, eds. Environmental Psychology. New York: Holt, Rinehart and Winston, 1970.

Rapoport, Amos. House, Form and Culture. Englewood Cliffs, New Jersey: Prentice Hall, 1969.

Sanoff, H. and S. Cohn, eds. Proceedings of EDRA 1. Raleigh, North Carolina: University of North Carolina State, 1970.

Sommer, Robert. Personal Space: The Behavioral Basis of Design. Englewood Cliffs, New Jersey: Prentice Hall, 1969.

Van Der Ryn, S. and M. Silverstein. Dorms at Berkeley: An Environmental Analysis.[x] New York: Educational Facilities Laboratories, 1967.

Venturi, Robert. Complexity and Contradiction in Architecture. New York: The Museum of Modern Art, 1966.

[x]Indicates reference was unavailable for annotation.

APPENDIX: REFERENCE SEARCH PROCEDURES

As mentioned in the forward, some of the library research was conducted by students at Middle East Technical University. By the time the research was begun, class discussions had already been held related to Sections 1 through 3 of this bibliography, so the criteria for identifying potential additional references was established. The following search was conducted.

1. CPL Bibliography No. 123 was used as a starting point since it covered articles through 1969.

2. The Art Index was reviewed from November 1963 through October 1972 under the following categories: architecture, environment, housing, human behavior, man-influence on environment, man-influence on nature, planned unit development, psychology, social-research, social-psychology, sociology-urban, and zoning.

3. The International Index was examined from April 1965 through December 1972 under the following categories: human behavior, human ecology, man-influence on environment, psychology, social-research, social-psychology, and sociology-urban.

4. In addition to reviewing the above indexes, the following periodicals were examined in detail:

   Ekistics, January 1969 - May 1973;
   Environment and Behavior, March 1969-December 1972;
   Journal of the American Institute of Planners, January 1969-January 1973;
   Journal of the Town Planning Institute, January 1969-December 1971;
   Journal of Social Issues, 1969-1972;
   American Sociological Review, 1969-1972;
   American Journal of Sociology, 1969-1972;
   American Behavioral Scientist, September 1969-February 1973;
   American Psychologist, 1969-1972;
   Architectural Review, 1969-1972;
   Architectural Design, 1969-1972.

5. The books, collections of articles and special periodical issues listed in the preceding section were reviewed carefully, and individual articles annotated for inclusion where appropriate.

This process generated a list of several hundred potential references in addition to the ones already available. Most of these were read, and the most important were annotated and included in this bibliography.

INDEX TO ANNOTATED PORTION OF BIBLIOGRAPHY

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